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BULLETIN

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TORREY BOTANICAL CLUB

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Some noteworthy lichens from Jamaica

LINCOLN W. RIDDLE

(WITH PLATE 21)

In the spring of 1912, Dr. Joseph A. Cushman, Assistant Curator of the Boston Society of Natural History, collected in the Island of Jamaica, in the West Indies, a set of lichens representing 109 species and varieties. A study of these has resulted in the discovery of two new species and of a number of other species of sufficient interest to be worthy of record. To the discussion of these species has been added a revision of the American species of *Megalospora*, four of which occur in Jamaica. A complete set of the lichens collected by Dr. Cushman has been deposited in the herbarium of the Boston Society of Natural History.

NEW SPECIES

1. **Buellia rinodinospora** Riddle, sp. nov.

Thallus epiphloeodes crustaceus uniformis effusus haud limitatus, albidus vel cinerascenti-albidus subnitidus, crassitudine mediocris, inaequalis partim rimulosus partim rimoso-areolatus et demum diffractus; KOH flavescens; hypothallo nullo. Apothecia mediocria, 0.5–1.0 mm. lata, subelevata, nitida, primum concava demum plana vel satis convexa, rotunda regularia; disco scabro, nudo, castaneo vel fusco-nigricante nunquam atro; margine proprio nigro, persistente, primum crasso integro demum tenue crenulato; epithecio fulvo; hymenio decolore, circ. 180 μ altit.; excipulo et hypothecio fusco-nigricante. Asci 8-spori. Sporae fuscae oblongae sat curvatae, biloculares placodiomorphae,

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loculis poro confluentibus, 36–50 × 15–20 μ. [PLATE 21, FIGS. 1, 4.]

On bark, Newcastle, Jamaica, March 1912, *J. A. Cushman 155.*

This species is distinct from all other *Buellias* in the large size and polar-bilocular character of the spores. Wainio (Act. Soc. Sci. Fenn. **7**: 172. 1890) describes a *Buellia placodiomorpha* with a similar type of spore but with four cells and reaching a size of only 19 × 10 μ. From species of *Rinodina*, this new species can be distinguished by the apothecia being of the lecideine type rather than the lecanorine.

2. **Chiodecton** (Sect. ENTEROGRAPHA) **leiostictum** Riddle, sp. nov.

Thallus crustaceus crebre contextus uniformis effusus, linea nigra limitatus, albidus vel demum sat sordide ochroleucus opacus, crassus (0.15–0.2 mm. crassit.) rimuloso-areolatus; KOH intense flavescens dein rubescens; hypothallo nullo. Apothecia numerosissima, thallo immersa, punctiformes rotundata vel subdifformia haud elongata, minuta, 0.12–0.16 mm. lata, seriata uniserialia vel interdum serie ramosa disposita serialibus rectis vel flexuosis, aut rarius partim irregulariter aggregata; disco atro parum pruinoso dein nudo, plano, superficiem thallo aequante; margine distincto nullo; epithecio fuligineo-nigro; amphithecio supra fuligineo-nigro infra decolore; hypothecio decolore; hymenio decolore, 100–120 μ altit. Asci 8-spori. Sporae decolores anguste oblongae, 5–8 loculares loculis cylindricis vel satis rotundatis, 20–30 × 4–6 μ, halonae 4–5 μ crasso indutae. [PLATE 21, FIGS, 3, 5.]

On old decorticated wood, Montego Bay, Jamaica, March 1912, *J. A. Cushman 15.*

In 1886 (Flora **69**: 104), Nylander published a list of the Graphidaceae collected by Charles Wright in Cuba. The list included many new species which were given merely as *nomina nuda*. For most of these no descriptions were ever published. The species just described was named by Nylander (*l.c.*) *Stigmatidium leiostictum*. Through the courtesy of Professor Farlow, I have been able to make a microscopic examination of original material of Wright's Graphideae Cubanae No. 157, cited by Nylander, and it has proved to be identical with the specimens collected by Dr. Cushman in Jamaica. Species of *Chiodecton* Sect. *Enterographa* with spores more than four-celled are comparatively few in number, and among these *Ch. leiostictum* is distinct in the serial arrangement of the punctiform apothecia.

NOTEWORTHY SPECIES NOT PREVIOULSY RECORDED FROM JAMAICA

1. ANTHRACOTHECIUM OCHRACEO-FLAVUM (Nyl.) Muell. Arg. Linnaea **43**: 44. 1880.

Verrucaria ochraceo-flava Nyl. Expos. Pyren. 50. 1858.

On bark, Montego Bay, *J. A. Cushman 122.* Known elsewhere from Cuba, Mexico, Colombia, and the East Indies.

2. HEUFLERIA SEPULTA (Mont.) Trevis. Flora **44**: 23. 1861.

Astrothelium sepultum Mont. Ann. Sci. Nat. Bot. II. **19**: 74. 1843.

On bark, Mandeville, *J. A. Cushman 152.* Known elsewhere from Cuba, Guiana, Brazil, and Peru.

3. LAURERA GIGANTOSPORA (Muell. Arg.) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. **I**^{1*}: 71. 1903.

Bathelium gigantosporum Muell. Arg. Bot. Jahrb. **6**: 394. 1885.

On bark, Mandeville, *J. A. Cushman 44.* Known previously from the original collection only, made by Charles Wright in Cuba; but closely related and perhaps not specifically distinct from **Laurera megaspermum** (Mont.) Riddle, comb. nov. (*Trypethelium megaspermum* Mont. Ann. Sci. Nat. Bot. II. **19**: 68. 1843), which is known from Cuba, Guiana, and Brazil.

4. GRAPHINA CHRYSOCARPA (Raddi) Muell. Arg. Flora **63**: 41. 1880.

Opegrapha chrysocarpa Raddi, Atti Soc. Ital. Sci. **38**: 34. 1820.

On bark, Mandeville, *J. A. Cushman 49.* A striking species known elsewhere from Porto Rico, Costa Rica, Colombia, and Brazil.

5. GRAPHINA PLATYGRAPTA Muell. Arg. Flora **71**: 495. 1888.

On bark, Mandeville, *J. A. Cushman 54.* This species was based on material collected by Sintenis in Porto Rico, and hitherto has been known from the original collection only. Owing to the war, I have been unable to see the type, but the species has such distinctive characters, and Mueller-Argau's description applies so well to Dr. Cushman's specimens, that there can be no doubt as to the identity of the two. *G. platygrapta* belongs to the section *Platygraphopsis* (see PLATE 21, FIGS. 2, 6). The original description gave the spore-measurements as 150 × 30 μ. I find that they vary from 150–180 × 30–50 μ. An examination of Wright's Graphideae Cubanae No. 4, labelled with a manuscript name of Nylander's in the Tuckerman Herbarium, proves that it is the same as Dr. Cushman's Jamaica specimens. This species is, therefore, now known from Cuba, Jamaica, and Porto Rico.

6. PHAEOGRAPHINA QUASSIAECOLA (Fée) Muell. Arg. Mem. Soc. Phys. Hist. Nat. Genève 29^8: 47. 1887.

Thecaria quassiaecola Fée, Essai Crypt. 97, *pl. 1, f. 16.* 1824.

This is a striking and peculiar species in which the prominent apothecia vary from elongated-lirelliform to oblong and even entirely circular. Occasional specimens occur with all the apothecia circular, and such specimens would easily be mistaken for a *Gyrostomum*. Mueller-Argau says (*op. cit.* 48) that Fée's citation of the type-locality as "America" must have been a mistake as the original specimen in Fée's herbarium came from Madagascar. And hitherto the species has been recorded from the Old World only: from tropical Africa, Ceylon, New Caledonia, and Australia. But it appears to be sufficiently common in Jamaica, as I have in my herbarium the following specimens from that island:—Mandeville, March, 1912, *J. A. Cushman 52;* also January, 1909, *A. E. Wight 66;* near Troy, September, 1906, *Elizabeth G. Britton & Delia W. Marble 265;* also June, 1909, *A. E. Wight 140a, 202, 208.* Furthermore, the specimen of Wright's Graphideae Cubanae No. 7, in the Tuckerman Herbarium, proves to be this species, having been incorrectly determined as "*Graphis scalpturata* var. *plurifera* Nyl." which is a synonym of *Phaeographina caesiopruinosa* (Fée) Muell. Arg. Both *Ph. scalpturata* and *Ph. caesiopruinosa* belong to the Section *Eleutheroloma*, in which the amphithecium is black at the sides only and colorless beneath; while *P. quassiaecola* belongs to the Section *Pachyloma*, in which the amphithecium is completely black and very thick at the base. With the correct identification of this Cuban specimen, we have three stations for the species in the West Indies.

7. LECANACTIS PREMNEA var. **plurilocularis** (Nyl.) Riddle, comb. nov.

Lecidea plurilocularis Nyl. Ann. Sci. Nat. Bot. IV. **15**: 49. 1861.

On bark, Montego Bay, *J. A. Cushman 67*. Known elsewhere from Cuba, Colombia, Peru, New Caledonia, the East Indies, and India.

8. **Ocellularia chionostoma** (Nyl.) Riddle, comb. nov.

Thelotrema chionostoma Nyl. Ann. Sci. Nat. IV. **19**: 329. 1863.

On bark, Montego Bay, *J. A. Cushman 106*. Known previously from the original collection only, made by Charles Wright in Cuba.

9. PHAEOTREMA PLATYCARPOIDES (Tuck.) Muell. Arg. Flora **69**: 311. 1886.

Thelotrema platycarpoides Tuck. Proc. Am. Acad. Arts Sci. **6**: 270. 1864.

On bark, Montego Bay, *J. A. Cushman 80*. Known previously from the original collection only, made by Charles Wright in Cuba.

10. **Lopadium castaneum** (Mey. & Flot.) Riddle, comb. nov.

Lecanora subfusca var. *castanea* Mey. & Flot. Nova Acta Acad. Caes. Leop. Carol. **19** (suppl. 1): 224. 1843.

On bark, Newcastle, *J. A. Cushman 29*. Known elsewhere only from Brazil.

11. PERTUSARIA VERRUCOSA (Fée) Mont. Ann. Sci. Nat. II. **19**: 78. 1843.

Trypethelium verrucosum Fée, Essai Crypt. 66. *pl. 18, f. 3*. 1824.

On bark, Newcastle, *J. A. Cushman 26*, and Mandeville, *J. A. Cushman 50*. Known elsewhere from Guadeloupe and Guiana.

12. RAMALINA PERUVIANA Ach. Lich. Univ. 599. 1810.

This species seems to be common in Jamaica. I have the following specimens in my herbarium: Mandeville, *A. E. Wight 95, 96; Elizabeth G. Britton 437; J. A. Cushman 47;* Catadupa, *J. A. Cushman 14*. I have compared one of the specimens collected by Wight with the type-specimens of Acharius in the Botanical Museum at Helsingfors, Finland, and the determination is certain. Known elsewhere from Porto Rico and Peru.

MEGALOSPORA

In an enumeration of Jamaica lichens in May, 1912, I described in Mycologia (4: 129) two new species of *Megalospora: M. Cummingsiae* and *M. jamaicensis*. The following autumn, I had an opportunity to study all of the material of this genus, including a number of authentic specimens in the collection of Mueller-Argau, at the Boissier Herbarium, Chambèsy, Switzerland. This led me to a detailed study of the principal species and as four of these occur in Jamaica it will not be out of place to present, herewith, the results of this study. Two of the species are variable but with well-marked varieties, which have been recognized by various authors and are certainly worthy of varietal names.

The genus *Megalospora* was established by Meyen and Flotow in 1843 (Nov. Act. Acad. Caes. Leop. Carol. **19** [suppl. 1]: 228), with *M. sulphurata* as the type-species. The species were included under *Lecidea* by Nylander; under *Patellaria* by Mueller-Argau; and under *Heterothecium* Sect. *Psorothecium* by Tuckerman. But in accordance with current ideas of the value of spore-characters in the classification of crustose lichens, Zahlbruckner (in Engler-Prantl, Nat. Pflanzenfam. I^{1*}: 134. 1905) has revived *Megalospora* as a distinct genus, distinguished from the other Lecideaceae by the thick-walled, two-celled spores of large size. The commonest species is the variable *M. versicolor* (Fée) Zahlbr., of which many of the other proposed "species" are synonyms or varieties.

The following key and citations of species and synonymy will serve to summarize the results of my study of the American species and varieties of *Megalospora*.

- A. Growing on evergreen leaves.............................5. *M. premneella*
- AA. Growing on the bark of trees.
  - B. Spores straight (PLATE 21, FIGS. 9, 10).
    - C. Thallus more or less straw-colored, apothecia with fulvous disk and straw-colored margin........................1. *M. sulphureorufa*
    - CC. Thallus ashy or whitish, apothecia variously colored, but the margin never straw-colored..........................(2. *M. versicolor*).
      - D. Margin white or pallid, contrasting with the fulvous, aeruginous, or black disk.............2*b*. *M. versicolor* var. *livido-cincta*
      - DD. Margin concolorous with the disk or nearly so, at least not pallid.
        - E. Apothecia variously colored: carneous, fulvous, aeruginous, or black, regular in form, and rarely over 1.5 mm. diam. 2*a*. *M. versicolor* var. *dichroma*

EE. Apothecia black and difform, reaching 3 mm. diam. 2*c*. *M. versicolor* var. *major*

BB. Spores curved.

C. Thallus smooth or granular, but not sorediate; spores 50–65 × 28–35μ, reniform, the individual cells little longer than wide (PLATE 21, FIG. 7.) (3. *M. sulphurata*)

D. Thallus smooth or nearly so, apothecia 1.5–3 mm. diam.

E. Apothecia bay-brown to dark chestnut-brown, blackening only when old............3*a*. *M. sulphurata* var. *genuina*

EE. Apothecia always black....3*b*. *M. sulphurata* var. *nigricans*

DD. Thallus granular-uneven, apothecia 3–6 mm. diam., blackening. 3*c*. *M. sulphurata* var. *megacarpa*

CC. Thallus verrucose, granulate, and powdery-sorediate; spores 70–125 × 20–30 μ, the individual cells about twice as long as wide (PLATE 21, FIG. 8)................................4. *M. Cummingsiae*

1. **Megalospora sulphureorufa** (Nyl.) Riddle, comb. nov.

Lecanora sulphureorufa (Nyl. Bull. Soc. Linn. Norm. II. **2**: 69. 1868.

Megalospora jamaicensis Riddle, Mycologia **4**: 129. 1912.

JAMAICA: Newcastle, *J. A. Cushman 24;* without definite locality, *Clara E. Cummings 138, 142.*

At the time that *M. jamaicensis* was published, I was sure that there was no American species to which the specimens so named could be assigned. But while working at the Boissier Herbarium, I found an authentic specimen of the plant called *Lecanora sulphureorufa* Nyl., based on three collections from two islands, New Caledonia and Lifu, situated between the Fiji Islands and Australia. This proved to be identical with my material from Jamaica. This is a remarkable distribution, and as the species is a conspicuous one, it seems extraordinary that it should never have been collected in South America, if it occurs there.

2. MEGALOSPORA VERSICOLOR (Fée) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. I^{1*}: 134. 1905.

Lecanora versicolor Fée, Essai Cryptog. 115. *pl. 28, f. 4.* 1824.

This species occurs in three varieties worthy of receiving names, as follows:—

2*a*. MEGALOSPORA VERSICOLOR var. **dichroma** (Fée) Riddle, comb. nov.

Lecidea dichroma Fée, Bull. Soc. Bot. Fr. **20**: 319. 1873. According to an authentic specimen in the Boissier Herbarium!

Lecidea incondita Krempelh. Flora **59**: 316. 1876. This was based on the same collection from Brazil (*Glaziou 5520*) as Fée's species.

Lecidea versicolor var. *vigilans* Nyl. Act. Soc. Sci. Fenn. **7**: 461. 1863 (in greater part). Not *Lecanora vigilans* Taylor, London Jour. Bot. **6**: 159. 1847! The type of Taylor's species is in the herbarium of the Boston Society of Natural History. There are two specimens, one from Mauritius and the other from Peru. But they represent two different species, and as the Mauritius specimen, which is cited first in Taylor's original description and should, therefore, be considered the actual type, is a species of *Bombyliospora*, the name *vigilans* Taylor can not be used in connection with *Megalospora versicolor*, even though the specimen from Peru belongs to that species. As the name *vigilans* has been used as a varietal name for both *Megalospora versicolor* and *M. sulphurata*, and is actually a *Bombyliospora*, it will make for clearness to drop it altogether.

According to Fée's original description of *Lecanora versicolor*, the var. *dichroma* corresponds to the typical form of the species, with the apothecia characteristically variable in color; but there is a tendency toward darkening, and the specimens having all the apothecia entirely black, but still small and regular, as is frequently the case, are to be considered merely as mature plants of this variety.

JAMAICA: without definite locality, *Clara E. Cummings 151, 153;* also in Merrill's Lich. Exsic. No. 230.

Specimens examined from Cuba, Porto Rico, Mexico, Costa Rica, Colombia, Venezuela, and Brazil (spec. authent.!); recorded also from Australasia and from Africa.

2*b*. MEGALOSPORA VERSICOLOR var. **livido-cincta** (Muell. Arg.) Riddle, comb. nov.

Patellaria livido-cincta Muell. Arg. Flora **64**: 227. 1881.

Patellaria versicolor var. *livido-cincta* Muell. Arg. Bull. Soc. Roy. Bot. Belgique **32**: 141. 1894.

Specimens examined from Mexico, Costa Rica, and Brazil (type!).

2c. MEGALOSPORA VERSICOLOR var. **major** (Wainio) Riddle, comb. nov.

Lecidea versicolor var. *major* Wainio, Act. Soc. Sci. Fenn. 7^2: 36. 1890. Authentic specimen examined from Brazil!

3. MEGALOSPORA SULPHURATA Mey. & Flot. Nov. Act. Acad. Caes. Leop. Carol. **19** (suppl. 1): 228. 1843.

The species is represented in America by three varieties, as follows:—

3*a*. MEGALOSPORA SULPHURATA var. **genuina** Riddle, nom. nov.

Patellaria sulphurata var. *vigilans* Muell. Arg. Flora **69**: 288. 1886. Not *Lecanora vigilans* Taylor (compare discussion given above under *M. versicolor* var. *dichroma*).

Apothecia primum pallida vel rufescentia vel tandem subnigrescentia.

According to an authentic specimen in the Boissier Herbarium, these are the characters of the original type-form of Meyen and Flotow.

JAMAICA: Gordon Town, 1884, *J. Hart.*

Specimens examined from Mexico, Colombia, Brazil, and the Philippines (spec. orig.!).

3*b*. MEGALOSPORA SULPHURATA var. **nigricans** (Muell. Arg.) Riddle, comb. nov.

Patellaria vigilans var. *nigricans* Muell. Arg. Flora **64**: 227. 1881.

Specimens examined from Mexico, Venezuela, Brazil (type!), and Australia.

3*c*. MEGALOSPORA SULPHURATA var. **megacarpa** (Nyl.) Riddle, comb. nov.

Lecidea megacarpa Nyl. Ann. Sci. Nat. IV. **11**: 260. 1859.

Specimens examined from Costa Rica, Brazil, Ceylon, and Mauritius (spec. authent.!).

4. MEGALOSPORA CUMMINGSIAE Riddle, Mycologia **4**: 129. 1912.

JAMAICA: without definite locality, *Clara E. Cummings 129* (type!). Endemic.

5. MEGALOSPORA PREMNEELLA (Muell. Arg.) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. I^1*: 134. 1905.

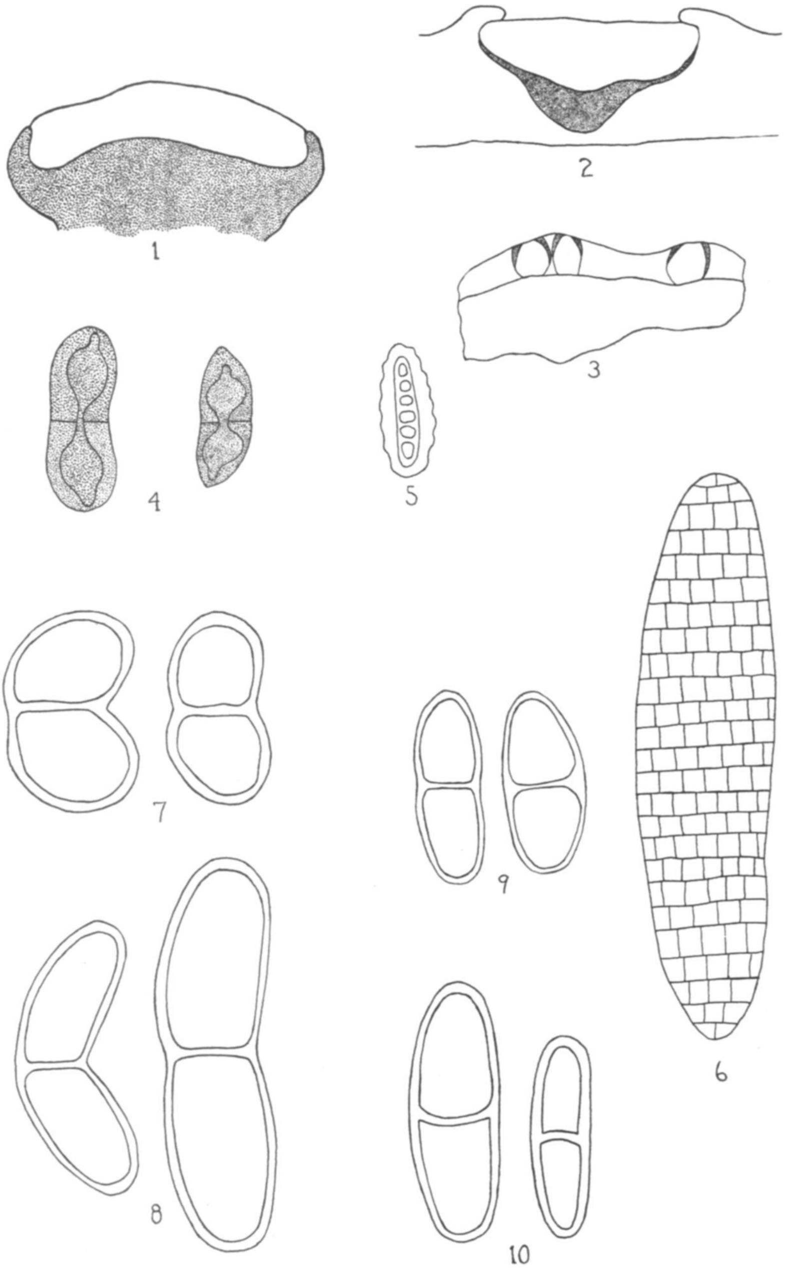
Patellaria premneella Muell. Arg. Lich. Epiphyll. 5. 1890.

Specimen examined from Brazil (type!). Endemic.

Explanation of plate 21

All figures were drawn with a camera-lucida: FIGS. 1, 2, and 3, at a uniform magnification of 41 diameters; FIGS. 4–10, at a uniform magnification of 385 diameters. The plate has been reduced approximately one half in reproduction. Brown or black coloration is indicated by stippling.

FIG. 1. Vertical section of apothecium of *Buellia rinodinospora* Riddle.
FIG. 2. Vertical section of apothecium of *Graphina platygrapta* Muell. Arg.
FIG. 3. Vertical section of apothecium of *Chiodecton leiostictum* Riddle.
FIG. 4. Spores of *Buellia rinodinospora* Riddle.
FIG. 5. Spore of *Chiodecton leiostictum* Riddle, with mucous envelope.
Fig. 6. Spore of *Graphina platygrapta* Muell. Arg. (the cells semi-diagrammatic).
FIG. 7. Spores of *Megalospora sulphurata* Mey. & Flot.
FIG. 8. Spores of *Megalospora Cummingsiae* Riddle.
FIG. 9. Spores of *Megalospora versicolor* (Fée) Zahlbr.
FIG. 10. Spores of *Megalospora sulphureorufa* (Nyl.) Riddle.



RIDDLE: NOTEWORTHY LICHENS FROM JAMAICA